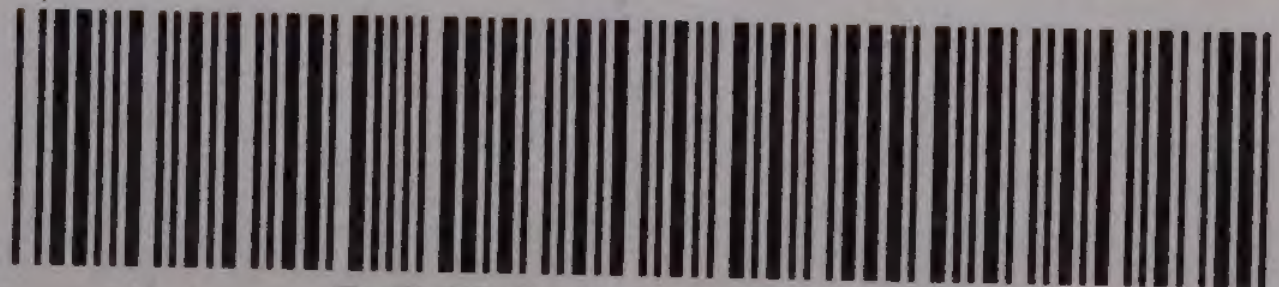
THE DOCTOR'S EMERGENCY REMINDER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THE DOCTOR'S EMERGENCY REMINDER

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INTRODUCTORY

BY the term "emergency" is here meant an occasion for medical or surgical intervention of such immediacy that a few minutes' delay may be fatal. For present purposes, therefore, an emergency call is a very different thing from an urgent call; the latter term rightly including all those summonses which, through pain or danger to life, call for immediate response, even though immediate action may but slightly affect the prognosis.

There are, again, many conditions in which delay in diagnosis, and therefore in treatment, may enormously in-

crease the danger. Such are gastric ulcer, appendicitis and diphtheria, which yet will not be referred to in this booklet, as their correct treatment can never be in doubt, and their diagnosis depends on facts which should never be far below the surface of the practising doctor's mind. Rarely, moreover, do conditions belonging to this class arise with that suddenness which we associate with the sort of emergency here considered.

In dealing with a medical or surgical emergency, three factors are needed for effectiveness. The necessary knowledge; the innate or trained capacity for bringing that knowledge quickly to bear on an unexpected problem; and the requisite equipment at hand. A man may have a

grand store of knowledge and quick wits ; yet, if, in a case of poisoning, he cannot put his hand on a stomach-tube, a hypodermic syringe, or the suitable antidote, his knowledge will be worth exactly nothing—except for the enlightenment of the coroner.

When called to attend an emergency, not a single minute should be lost. A wasted minute may easily determine the result. Not more than a few seconds should be spent in obtaining from the messenger, whilst slipping on one's hat and coat, some idea of the nature of the case ; but it is only occasionally that this report is very helpful—or, at any rate, sufficiently helpful to justify loss of time. Proceed at once —armed with the emergency bag—to the sick or injured patient and, whilst examining

him, get what information you can from the most sober and collected person present. Coincidently, request those who know nothing about the matter to go away; or, as has been wisely suggested, tactfully give them something to do, such as making tea or fetching some indifferent object from your house.

THE EMERGENCY BAG

Every doctor should, in his consulting room, have always ready a small bag or case furnished with those things that may be immediately required in some life-or-death emergency. This should be periodically overhauled, and if necessary re-charged, even though it may not have been called into use; for the whole value of such an outfit depends on its absolute readiness for action. Such an emergency bag should contain the following articles, together with any others that the experience or ingenuity of the individual practitioner may suggest. It is well, however, not to over-

load it, and it is a good plan to place in the bag a card with a list of its contents. This will serve as a reminder in a moment of crisis, and will also help in keeping the bag furnished.

Soft stomach-tube with funnel.
Small stomach-tube for children.
Mouth-gag.
Hypodermic syringe with three or four needles in perfect order.
Apparatus for saline intravenous injection.
Douche-can, rubber tubing and long rectal tube.
Bandages of different widths.
Sterile gauze.
Adrenalin gauze.
Cotton-wool.
Rubber tourniquet.
Minim measure.
Ligatures.
Surgical needles.
Artery forceps.

Scalpels.
Scissors.
Half an ounce of Tincture of Iodine.
Four ounces of Chloroform.
Four ounces of Methylated Spirit.
Five ounces of Olive Oil.
Two ounces of French Turpentine.
Two ounces of Spt. Arom. Aromat.
Two ounces of Glycerine.
Two ounces of Hydrogen Peroxide.
Two ounces of Ether.
Two ounces of Brandy.
A few ounces of powdered Chalk.
A few ounces of Bicarbonate of Soda.
A few ounces of finely powdered Animal Charcoal.
A few ounces of Mag. Sulph.
A few ounces of heavy Magnesia.

A few ounces of Dialysed Iron.
An ounce of Glucose.
Half an ounce of Tinct. Ferri. Perchlor.
A drachm of Compound Jalap Powder.
Compressed Tablets of :—
- Copper Sulphate (grs. 3).
- Zinc Sulphate (grs. 10).
- Chloral Hydrate (grs. 10).
- Compound Saline (for preparing solutions for injection).
- Pot. Permang. (grs. 5).
- Tannin (grs. $2\frac{1}{2}$).
- Sodium Citrate (grs. 5).

Hypodermic Tablets of :—
- Morphine (gr. $\frac{1}{3}$, gr. $\frac{1}{4}$ and gr. $\frac{1}{8}$).
- Apomorphine (gr. $\frac{1}{10}$).
- Digitalin (gr. $\frac{1}{100}$).
- Atropine (gr. $\frac{1}{60}$).
- Pilocarpine Nit. (gr. $\frac{1}{2}$).
- Pot. Permang. (grs. 2).
- Strych. Sulph. (gr. $\frac{1}{60}$).
- Caffeine (gr. $\frac{1}{2}$).

Hypoloids or Ampoules containing :—

Adrenalin (1 in 1,000).

Infundibular Pituitary Extract (10 international units per c.c.).

Novocaine or other local anaesthetic.

Insulin (50 units).

CASES OF POISONING

Some General Hints

Poisoning cases do not always lend themselves to that discriminatory treatment which we are able to devote to less urgent pathologic emergencies. The nature of the poison is not always apparent, nor is there always time for a fine selection of appropriate antidotes. It is well, therefore, to have at one's finger-tips a sort of routine general procedure, of wide, even if not of universal, applicability. Clearly, the first thing to do when it is possible is to remove from the stomach any poisonous material that has not already been absorbed. Except on those rare occasions when we know a poison to

have been administered hypodermically, the induction of emesis or stomach lavage constitutes the obvious first step. If caustic acids or caustic alkalies have been taken to such an extent as to make the passage of a stomach-tube impossible or harmful, treatment will matter little, for the case is almost certainly a hopeless one. Naturally, also, there is no point in emptying the stomach when the poison is gaseous. With these exceptions, it is to the stomach-tube, preceded or supplemented by emetics, that we should first resort in all cases of poisoning. With the help of a makeshift gag and the finger as guide, it is easy to pass the stomach-tube to the back of the pharynx and down the oesophagus, even in unconscious patients. It is well to pour water into the

funnel and so dilute the stomach's contents before syphoning any out. This procedure should, of course, be repeated again and again. Sometimes an emetic administered beforehand leads to helpful vomiting even after the stomach-tube has been withdrawn. When we know that the poison is alkaloidal in nature, dilute solutions of permanganate of potash (say, 1 in 1,000) or solution of tannin (1 in 500) may desirably be employed.

Of emetics, apomorphine hydrochloride, in one-tenth grain doses, has the great advantage of being administrable hypodermically. It usually acts within a few minutes, and is more certain in its action than is any drug administered by the mouth. It is, of course, narcotic as

well as emetic; but it is doubtful if this constitutes any practical limit to its applicability. Next in value comes sulphate of zinc, which should be given in half-drachm doses dissolved in water. When confined to such resources as the domestic cupboard furnishes, a dessert-spoonful of mustard in a pint of water, or warm concentrated solutions of common table salt, supplemented by tickling the throat, may help.

Having removed the unabsorbed poison, it is necessary to do what we can to neutralise that which has been absorbed; and coincidently to protect the lining walls of the stomach and intestine from further damage. The use of tannin solution or solution of permanganate of potash for stomach lavage, as has been said, neutralises alka-

loidal poisons whilst the actual work of elimination is being carried out. The alkaloids are thereby oxydised or precipitated; in the former case, being destroyed; in the latter, being temporarily rendered harmless, though rapid elimination is still essential. In nearly all forms of poisoning, it is safe to give by the mouth abundance of milk and of white-of-egg in water. With the exception of phosphorus, santonin and cantharides poisoning, oil also is generally useful. Powdered charcoal, soapy water, chalk and lime are nearly always harmless and nearly always do some good. The natural antidotes of strong acids are dilute alkalies, such as lime—though, when possible, we should avoid the carbonates as they involve the liberation of carbonic acid gas in bulk.

Similarly, the antidote of the caustic alkalies is dilute acid, such as vinegar and water or lemon juice. Carbolic acid is not strictly an acid. It and preparations such as lysol, Jeyes' Fluid and the like, are best countered by solutions of Epsom salts. Oxalic acid should be neutralized by lime, chalk, or other calcium salt, with which it combines to form insoluble calcium oxalate.

In all forms of poisoning, the general condition of the patient needs coincident attention. Especially should he be protected from cold by means of hot-water bottles and blankets. And every effort should be made to husband his strength. In suitable cases, the value of morphia for the relief of pain and for promoting general composure should not be forgotten.

THE COMMONER POISONS

ACONITE

Taken as Tincture or Liniment, or as roots or leaves of the plant Monkshood.

Symptoms—Tingling and numbness of tongue and mouth. Nausea and possible vomiting. Numbness of fingers. Deafness. Dimness of sight. Some paralysis of limbs. Mind usually clear.

Treatment—Emetics. Stomach-tube. Saline injection. Sal Volatile. Warmth to extremities. Keep patient recumbent. If necessary, artificial respiration. Give hypoderm of Digitalin, gr. $\frac{1}{100}$; or Atropine, gr. $\frac{1}{60}$.

ALCOHOL

Symptoms—Confusion of mind. Eyes congested. Expression vacant. Giddiness and tottering gait. Possible convulsions or even coma.

Treatment—Emetic and stomach tube. Rouse patient, but not with cold water except in mild cases. Apply Ammonia vapour to nostrils. Give hot strong coffee unless unconscious, in which case inject Strychnine, gr. $\frac{1}{60}$. Artificial respiration may be necessary.

AMMONIA

May be taken in mistake as Sal Volatile or as Liniment.

Symptoms—Those of corrosive poisons generally. Immediate burning pain in mouth, throat and stomach, the

lining membrane being swollen and often detached. Usually purging with straining.

Treatment—Abundance of dilute vinegar or lemon juice in water, or tartaric acid in water. Then give freely milk, white-of-egg and water, barley water and olive oil. A hypoderm of Morphia is desirable.

ANTIFEBRIN

Occasional overdose taken in headache powders.

Symptoms—Faintness. Nausea. Cyanosis. Profuse sweating. Collapse.

Treatment—Emetic and Stomach-tube. Keep patient recumbent. Warmth to extremities. Coffee. Strychnine, gr. $\frac{1}{60}$; or Digitalin, gr. $\frac{1}{100}$.

Taken as Tartar Emetic or other salt.

Symptoms—Burning heat with constriction in throat. Metallic taste and soreness of mouth. Violent pain in stomach with incessant vomiting and purging. Cramps in legs. Faintness. Clammy skin. Collapse. Urine not usually suppressed.

Treatment—Stomach-tube. Also Apomorphine if necessary, though the vomiting caused by the Antimony is usually more than adequate. In any case, give generous quantities of tepid water. Give half-drachm Tannin in water, repeating it as often as vomiting occurs. Give very strong tea freely. Keep patient warm with blankets

and hot water bottles. Give injection of Pituitary Extract, also of Morphine, gr. ½. Give saline injection rectally, or, better, intravenously.

ANTIPYRIN

Symptoms and *Treatment* as Antifebrin. (*Page* 24).

ARSENIC

A common ingredient of vermin-killers, rat-pastes, weed-killers, sheep-dips and fly-papers. Is a frequent cause of chronic poisoning.

Symptoms—Acute Arsenical poisoning presents much the same symptoms as those of Antimony poisoning. Burning pain in stomach. Vomiting and purging. Constriction in throat. Cramps in legs. Faintness and

collapse. Urine usually suppressed.

Treatment—Stomach-tube. Injection of Apomorphine. Copious repeated draughts of warm milk and water or hot water containing olive oil. The stomach-tube should be used again and again, so as thoroughly to wash out the stomach. The value of sesquioxide of iron, which is the recognised antidote, is questionable. Keep the body warm with hot water bottles and blankets. When acute symptoms have quieted down, give hypoderm of Morphine, gr. $\frac{1}{2}$.

ATROPINE

The active alkaloid of Belladonna. Sometimes taken as Tincture or Liniment; also

as berries of the Deadly Nightshade—a plant occasionally found in waste places near villages or country houses. The berries are black and shiny, a little smaller than a cherry.

Symptoms—Dryness of mouth and throat. Difficulty in swallowing. Narcosis. Extreme thirst. Skin flushed. Delirium. Urine often suppressed though frequent desire to pass water. Eyes prominent. Pupils dilated and not reacting to light. Prognosis usually good.

Treatment—Stomach-tube and emetics. Hypoderm of Pilocarpine Nitrate, gr. $\frac{1}{2}$. Sal Volatile. Strong hot coffee. Warmth to feet. Artificial respiration if necessary for a couple of hours.

BELLADONNA

See Atropine. (*Page* 27).

BRYONY

A common hedgerow plant with red berries, sometimes eaten by children.

Symptoms—Vomiting and purging. Pupils dilated. Giddiness and delirium.

Treatment—Stomach-tube or emetic. Brandy or Sal Volatile.

CANTHARIDES

This is sometimes taken as an aphrodisiac or to cause abortion. Popularly known as Spanish Fly.

Symptoms—Burning pain in throat and stomach with difficulty in swallowing. Vomiting and diarrhoea, often bloodstained. Salivation and incessant desire to

pass urine, but only a little albuminous fluid or blood passed. High temperature. Rapid pulse. Convulsions.

Treatment—Stomach-tube if seen early, otherwise Apomorphine or other emetic. Give hypoderm of Strychnine, gr. $\frac{1}{60}$. Also give hypoderm of Morphine, gr. $\frac{1}{2}$. Give white-of-egg and water, barley water, milk, gruel. Do not give oil.

CARBOLIC ACID

Many forms of Phenol are common causes of poisoning. Lysol has become one of the most frequently used by suicides.

Symptoms—Burning pain in mouth, throat and stomach, the lining membrane being usually whitened and partly destroyed. Difficulty in all movements of mouth and

throat. Bloodstained vomiting may occur. Skin cold, pale and clammy. Face livid. Smell of carbolic. Later, unconsciousness and loss of reflex movement. Coma.

Treatment—Very carefully insert soft stomach-tube and repeatedly wash out the stomach with half an ounce of Glauber Salts or Epsom Salts in a pint of warm water. Then give large quantities of white-of-egg in water, or milk, or a teacupful of olive oil in a pint of water. Inject ether hypodermically or give diluted brandy by the rectum. Warmth. Rectal injection of saline solution.

CARBON MONOXIDE

Poisoning from this gas may occur from geysers in unventi-

lated rooms, escape of coal gas under floor, running engines in closed motor garages, or from charcoal or slow-combustion stoves.

Symptoms—Giddiness. Singing in the ears. Drowsiness passing into coma. The latter may persist for days even in non-fatal cases.

Treatment—Get patient into the fresh air. If possible to obtain oxygen, this should be administered by means of a mask similar to that used for the administration of nitrous-oxide. If five per cent. of carbon dioxide can be mixed with the oxygen, so much the better, as this stimulates the respiratory centre. Warmth; stimulants; artificial respiration; injection of saline solution either rectally or intravenously.

CAUSTIC ALKALIES

Caustic Potash, Caustic Soda and Strong Ammonia are the commonest of these. For Symptoms and Treatment *see* Ammonia (*Page* 23).

CHLORAL

In spite of legal difficulties a good deal of chloral still finds its way into the hands of the lay public.

Symptoms—Face livid. Surface of body cold. Respiration and pulse slow. Temperature much below normal. Deep sleep.

Treatment—Hypoderm of Apomorphine, and stomach-tube. Apply warmth to body by blankets and hot-water bottles. Inject Strychnine, gr. $\frac{1}{60}$. Also Pituitary Extract. Rouse patient in every way. Artificial respiration if indicated.

CHLORODYNE

See Opium. (*Page* 49).

CHLOROFORM

The symptoms and treatment of poisoning from inhaled chloroform will be found on page 87. Chloroform is sometimes drunk by mistake, or deliberately with suicidal intent.

Symptoms.—Burning pain in throat and stomach. Dilated pupils. Sleep, passing into complete anaesthesia. Very weak pulse. Breath smells of chloroform.

Treatment—Thorough use of stomach-tube, supplemented by emetics. Give water containing carbonate of soda in solution freely. Keep patient recumbent, but do everything to rouse him. Inject Pituitary hypodermically. Artificial respiration. Give oxygen if available.

COAL GAS

See Carbon Monoxide. (*Page* 31).

COCAINE

Commonly taken hypodermically or by application to a mucous surface.

Symptoms—These vary very much with different individuals. Usually pallor. Faintness. Rapid respiration and pulse. Severe prostration. Mental excitement. Convulsions.

Treatment—If taken by mouth, stomach-tube and emetics. In all cases inject Strychnine, gr. $\frac{1}{60}$. Also Pituitary Extract. Keep body warm. Give hot strong coffee. Artificial respiration. Give oxygen if available.

COLCHICUM

Taken as the wine or other medicinal preparation, or as

some part of a plant known as Meadow Saffron or Autumn Crocus.

Symptoms—Pain in abdomen and throat. Thirst. Persistent vomiting and diarrhoea. Prostration. Pain in limbs. Small quick pulse.

Treatment—Stomach-tube. Emetic. Give repeated half-drachm doses of Tannin. Also abundant milk, barley water, or white-of-egg and water. Give a hypoderm of Morphine, gr. ½.

CONIUM

Conium or Hemlock is a native British plant, mistakable by the ignorant for parsley. It has a characteristic mousey smell.

Symptoms—Increasing loss of voluntary muscular power, including staggering gait and

inability to swallow, with, later, paralysis of the muscles of respiration. Loss of sight. Pupils dilated. Consciousness generally retained.

Treatment—Stomach-tube and emetic. Solutions of Tannic Acid. Injection of Strychnine, gr. $\frac{1}{60}$. Warmth, by hot-water bottles and blankets. Artificial respiration.

COPPER

Usually taken as solution of Copper Sulphate (Blue Vitriol). Chronic copper poisoning may arise from copper cooking vessels; though many alleged cases are doubtful.

Symptoms—Griping pain in stomach. Metallic taste. Vomiting and purging. Later, rapid pulse, jaundice, delirium, convulsions and coma.

Treatment—Stomach-tube and emetic, first giving large quantities of milk and eggs. Give plenty of barley-water or gruel. Give a hypoderm of Morphine, gr. $\frac{1}{3}$.

CORROSIVE SUBLIMATE

See Mercury. (*Page* 46).

CROTON OIL

May be taken as Liniment, or in error for Castor Oil.

Symptoms—Severe abdominal pain. Vomiting. Purging. Features pinched. Small weak pulse. Moist skin.

Treatment—Stomach-tube and emetic, first washing out stomach with milk and water. Give generous draughts of barley-water or gruel or white-of-egg with water or milk. Hypoderm of Morphine, gr. $\frac{1}{3}$.

CYANIDES

See Prussic Acid. (*Page* 56).

DIGITALIS

Generally taken as one of the medicinal preparations, though occasionally the leaves of the plant, the Common Foxglove, are eaten.

Symptoms—Abdominal pain. Purging and vomiting, the vomit usually bright green in colour. Slow irregular pulse. Pupils do not react to light. Skin cold and covered with sweat. Headache. Delirium. Coma.

Treatment—Stomach-tube and injection of Apomorphine. 20 gr. doses of Tannin in a teacupful of hot water, frequently repeated. Apply warmth by blankets and hot-water bottles. Keep patient strictly recumbent.

EXALGIN

Symptoms and Treatment as Antifebrin. (*Page* 24).

FUNGI

Many Fungi and Mushrooms are poisonous ; some owing to their specific poisonous principles, others to decomposition.

Symptoms—These vary much. Generally abdominal pain, vomiting and diarrhoea. Frequent mental excitement. Muscular twitchings. Convulsions. Extremities cold. Pulse slow.

Treatment—Stomach-tube and Hypoderm of Apomorphine. Give an ounce of castor oil. Apply hot-water bottles and warm blankets. Hypoderm of Atropine, gr. $\frac{1}{60}$, repeated half an hour later if necessary. Give saline injection either rectally or

intravenously it there has been severe purgation.

FOOD POISONS

Meat, fish and other articles frequently give rise to severe symptoms of poisoning. These symptoms vary much, but they generally include: abdominal pain, vomiting and diarrhoea, with cramps in the limbs.

Treatment—Stomach-tube. Hypoderm of Apomorphine, and a good dose of castor oil. Apply warmth by hot-water bottles and blankets. Give an ounce of brandy or whisky repeated in an hour or so if necessary. Give Hypoderm of Morphine, gr. ¼, if the pain is severe.

GAS

For symptoms and treatment of poisoning by coal-gas, *see* Carbon Monoxide. (*Page* 31).

HEMLOCK

See Conium. (*Page* 36).

HENBANE

See Hyoscyamus. (*Page* 43).

HEROIN

See Opium. (*Page* 49).

HYDROCHLORIC ACID

Known popularly also as Muriatic Acid or Spirits of Salt.

Symptoms—As of other corrosive acids. Severe burning pain in mouth and stomach. Lining of mouth and throat swollen and corroded. Vomiting, the vomit including altered blood and shreds of membrane. Pronounced collapse, rapid thready pulse.

Treatment—Large draughts of water should be given, and a soft stomach-tube carefully passed if seen early. Give

milk, gruel, and white-of-egg and water, having first given plenty of washing soda, whiting or chalk, mixed with water. Give hypoderm of Morphine, gr. $\frac{1}{3}$. Apply warmth to the body and the extremities.

HYDROCYANIC ACID

See Prussic Acid. (*Page* 56)

HYOSCINE: HYOSCYAMUS

The plant Hyoscyamus or Henbane is of the Parsnip order. There are several medicinal preparations; and the alkaloid Hyoscine or Scopolamine is extensively used.

Symptoms—Mental excitement. Skin flushed. Giddiness. Dilated pupils. Vomiting. Mental confusion and delirium, with marked drowsiness.

Treatment—Stomach-tube and hypoderm of Apomorphine. Also hypoderm of Pilocarpine Nitrate, gr. $\frac{1}{2}$, or Morphine, gr. $\frac{1}{3}$. Apply warmth by hot-water bottles and blankets. Artificial respiration if necessary.

IODINE

Symptoms—In acute poisoning, pain and heat in throat and stomach. Purging and vomiting. Thirst. Faintness.

Treatment—Give starch and cold water freely. Stomach-tube and hypoderm of Apomorphine. Give milk and eggs, gruel or arrowroot. Give hypoderm of Morphine, gr. $\frac{1}{2}$.

LABURNUM

Poisoning from Laburnum rarely occurs but with children, who sometimes eat the seeds or flowers or chew the bark.

Symptoms—Giddiness. Loss of muscular power. Nausea. Pupils dilated.

Treatment—Stomach-tube and emetic. Hot baths. Strong coffee. Artificial respiration if necessary.

LAUDANUM

See Opium. (*Page* 49).

LEAD

Acute lead-poisoning is most commonly due to Sugar of Lead or Goulard's Solution.

Symptoms—Metallic taste. Extreme thirst. Abdominal colic, somewhat relieved by pressure. Giddiness. Stupor. Cramps. Convulsions. Never diarrhoea.

Treatment—Stomach-tube and emetic. Give half an ounce of Epsom Salts or Glauber Salts in half a pint of water. Give white-of-egg in water,

and milk freely. Hypoderm of Morphine, gr. $\frac{1}{3}$.

LOBELIA

Symptoms–Much vomiting, with headache, giddiness, tremors and prostration. Possible convulsions.

Treatment—Stomach-tube and emetic. 20 grains of Tannin in a teacupful of water frequently repeated. Warmth applied by hot-water bottles and blankets. Keep the patient lying down.

LUNAR CAUSTIC

See Silver Nitrate. (*Page* 59).

MERCURY

Mercuric Chloride or Corrosive Sublimate is the principal Mercury compound that figures in toxicology. Even external applications, where there is extensive destruction of skin, may prove fatal.

Symptoms—When taken by mouth, metallic taste and constricted feeling in throat. Pain in stomach, with much vomiting and purging. Mucous membrane of mouth and throat white and swollen. Skin clammy. Feeble pulse. Convulsions. Mind usually remains clear.

Treatment—Before using stomach-tube or emetic, give very large quantities of white-of-egg mixed with water or milk. Flour and water is a poor substitute, but better than nothing. Then use stomach-tube and give hypoderm of Apomorphine.

MONKSHOOD

See Aconite. (*Page* 22).

MORPHIA

See Opium. (*Page* 49).

MUSHROOMS

See Fungi. (*Page* 40).

NAPHTHALINE

Domestically used for excluding moth from clothes.

Symptoms—Twitching of muscles. Giddiness. Drowsiness and Cyanosis.

Treatment—Stomach-tube and hypoderm of Apomorphine. Give no oil or fat.

NICOTINE

A very powerful poison used much by gardeners as an insecticide. Excessive tobacco chewing may produce acute poisoning.

Symptoms—Burning sensation in mouth and throat. Great faintness. Mental confusion. Dimness of sight. Cold clammy skin. Vomiting. Loss of consciousness.

Treatment—Stomach-tube and hypoderm of Apomorphine. 20 grains of Tannin in a teacupful of water frequently repeated. Hypoderm of Strychnine, gr. $\frac{1}{60}$. Apply warmth by hot-water bottles and blankets. Artificial respiration if necessary. Keep patient lying down.

NITRIC ACID

Symptoms and Treatment much as Hydrochloric Acid. (*Page* 42).

NUX VOMICA

See Strychnine. (*Page* 62).

OPIUM

Dozens of common preparations contain Opium. Among these are Laudanum, Paregoric, Nepenthe, Battley's Solution, Chlorodyne. The chief alkaloid is Morphine, which is often administered

hypodermically and is then not to be expelled from the body by the usual method.

Symptoms—At first, agreeable, slight mental excitement. Then drowsiness, weariness and lassitude. Pupils contracted. Face becomes pale or cyanosed. Respiration slow. Pulse weak. Unconsciousness passing into coma.

Treatment—When poison taken by the mouth, repeatedly wash out stomach with stomach-tube and administer emetic. Hypoderm of Apomorphine is not contraindicated. Give ten grains of Potassium Permanganate in a teacupful of water and repeat the dose twenty minutes later. Give plenty of water in addition. The stomach should then again be washed out with the stomach-tube. The Per-

manganate and the stomach-washing should be employed even when the Morphia has been introduced hypodermically. Give a hypoderm of Atropin, gr. $\frac{1}{30}$. Do everything to rouse the patient, but do not exhaust him. Apply ammonia vapour to the nostrils. Inject hypoderm of Caffeine, gr. $\frac{1}{2}$. Artificial respiration may have to be kept up for hours. Inject a pint of hot strong coffee into the rectum.

OXALIC ACID

This acid and its Potassium salt are used domestically and industrially for cleaning and bleaching purposes. The latter has the unfortunate name of Salts of Lemon. The crystals are not unlike those of Epsom Salts.

Symptoms—If an adequate dose be taken, the sequence of

events is rapid. Death may be almost instantaneous. In less acute cases, there is burning pain in the throat and stomach with vomiting, the vomit containing altered blood. Purging is usual. Pulse becomes thready, and there is general collapse.

Treatment—Carefully wash out the stomach with soft stomach-tube, using lime-water or saccharated solution of lime for the stomach-washing if possible. Chalk, whiting or any preparation of calcium is an antidote, an insoluble oxalate being formed. Give an ounce of castor oil. Do not give any salt of Potassium, Sodium or Ammonium.

PETROLEUM (Paraffin Oil)

Paraffin, Kerosene, and Petrol are occasionally taken accident-

ally, owing to their being frequently kept in gingerbeer or wine bottles.

Symptoms—Burning pain in mouth, throat and stomach, and vomiting (vomit generally smelling of paraffin or petrol). Surface of body cold. Face pale. Pulse weak. Great thirst.

Treatment—Stomach-tube and emetic. Hypoderm of strychnine, gr. $\frac{1}{60}$. Hot-water bottles and warm blankets.

PARALDEHYDE

Sometimes taken as overdose for its hypnotic effects.

Symptoms—Characteristic smell of breath. Shortness of breath. Pupils contracted. Surface of body warm. Pulse rapid. Unconsciousness—often very protracted.

Treatment—Stomach tube and hypoderm of apomorphine. Ammonia vapour to the nostrils. Hot blankets. Hot-water bottles. Hypoderm of strychnine, gr. $\frac{1}{60}$. Artificial respiration if necessary.

PERMANGANATE OF POTASH

A popular remedy for amenorrhoea. Also much used as a disinfectant.

Symptoms—Lips and mouth stained dark brown. Great pain in mouth, throat and stomach. Difficulty in swallowing. Vomiting. Weak pulse.

Treatment—Stomach-tube and hypoderm of apomorphine. Hot-water bottles and warm blankets. Hypoderm of strychnine, gr. $\frac{1}{50}$th.

PHENACETIN

A popular headache remedy.

Symptoms and *Treatment*—Much as Antifebrin. (*Page* 24).

PHOSPHORUS

A common ingredient of rat-poison; also sometimes taken by children through sucking matches.

Symptoms—Taste as of garlic. Burning pain in abdomen. Intense thirst. Vomiting, with phosphorus or garlic odour. Often disorganised blood-vomiting. Scanty albuminous urine. Weak pulse. Various haemorrhages common (petechiae, ecchymoses, epistaxis, metrorrhagia, etc.). Symptoms may intermit for a day or two or longer; then jaundice, distended abdomen, feeble pulse, possible

convulsions and coma. Fatal collapse possible at any stage.

Treatment—Stomach-tube and hypoderm of apomorphine. Also three-grain doses of copper sulphate dissolved in small teacupful of water every five minutes until vomiting, then half doses every quarter of an hour for an hour or two. Give Sanitas freely, if at hand. Give half ounce of Epsom salts. Give hypoderm of morphine, gr. $\frac{1}{4}$ to $\frac{1}{2}$. *Avoid all oils and fats.*

POTASH

For symptoms and treatment *see* Ammonia, *page* 23.

PRUSSIC ACID

Not uncommonly taken suicidally or given murderously, occasionally accidentally. The British Pharmacopoeia preparation contains two per cent.

prussic acid; Scheele's preparation contains four per cent. Essential oil of bitter almonds is also a source.

Symptoms—The symptoms are almost immediate; an adequate dose proving fatal with startling rapidity. If there is the slightest delay, the following stages may be recognised. Giddiness. Diminished power of movement. Eyes fixed. Pupils dilated. Skin cold and clammy. Pulse imperceptible. Gasping for breath. Complete insensibility, often within two minutes. Breath may smell of bitter almonds.

Treatment—Immediate stomach-tube and hypoderm of apomorphine. Without wasting time, drag patient into open air. Dash cold water over the surface, or pour it over

the head and chest from a height. Ammonia vapour to nostrils. Maintain artificial respiration continuously. Give hypoderm of atropine, gr. $\frac{1}{60}$. If not fatal within half an hour, there is a fair chance of recovery.

PTOMAINES

See Food Poisoning. (*Page* 41).

RAT POISONS

The active ingredients of these are usually Phosphorus (*page* 55) and Arsenic (*page* 26), alone or together.

SALTS OF LEMON

See Oxalic Acid. (*Page* 51).

SANTONIN

A common vermifuge, occasionally poisonous to children.

Symptoms—Disturbance of colour-vision. Headache. Vomiting. Convulsions. Unconsciousness.

Treatment—Stomach-tube and emetics. Avoid oil.

SAVIN

Occasionally taken to cause abortion.

Symptoms—Abdominal pain. Vomiting. Straining.

Treatment—Stomach-tube and emetics. Give an ounce of castor oil, and a hypoderm of morphine, gr. $\frac{1}{4}$.

SHEEP-DIP

This often contains Arsenic. (*Page* 26).

SILVER NITRATE

Popularly known as Lunar Caustic.

Symptoms—Pain in mouth and throat. Lining of mouth likely to be whitened. White flakes, which turn black in the air, often vomited.

Treatment—Give immediately two tablespoonfuls of common table salt in a tumbler of water, then give a hypoderm of apomorphine, and also an emetic by the mouth. Give freely barley-water, white-of-egg in water, and milk.

SNAKE-BITE

The adder is the only British poisonous snake.

Symptoms—These, of course, vary in intensity with the species of snake as well as the susceptibility of the individual. Shock. Faintness. Nausea. Cold sweats. Locally, pain and swelling. Sometimes discolouration. Paralysis of limbs, then of whole body, including tongue. Unconsciousness. Possibly convulsions.

Treatment—Tightly ligature the limb above the bite,— that is, between the bite and the heart. Then bandage from above downwards. Vigorously suck the wound, spitting out the saliva. Freely incise the bite, and immediately cut away or cauterise any discoloured tissue. Then inject into and round the spot hypoderm of potassium permanganate, 2 grs. If available, anti-venom serum should be injected either intravenously or hypodermically. Give hypoderm of pituitary or adrenalin.

STRAMONIUM

The Thorn-Apple is a plant not uncommonly found in waste places near houses. It is a coarsish herb, two or three feet high, with large, deeply serrated leaves. It

bears large, white, bell-shaped, erect flowers, heavily scented; and prickly seed-vessels. All parts of the plant are poisonous.

Symptoms—Dryness of throat. Dilated pupils. Quick pulse. Delirium. Coma.

Treatment—Stomach-tube and hypoderm of apomorphine; hypoderm of pilocarpine, gr. ½. Hot-water bottles and warm blankets. Artificial respiration if necessary.

STRYCHNINE

Taken or given deliberately; also accidentally, being a common ingredient of vermin-killers.

Symptoms—Tetanic convulsions, lasting from one to four or five minutes, every few minutes or with longer intervals. Feeling of suffocation.

Pupils dilated. Weak, rapid pulse. Staring eyeballs. Hearing and sight keen. Intellect generally clear. The convulsions do not involve the jaw muscles until late, whereas in tetanus these are early affected.

Treatment—Stomach-tube, but, if convulsions have started, tube should be introduced under chloroform. Hypoderm of apomorphine. Give half a drachm of tannin or half a drachm of tincture of iodine in a few ounces of water. Then use stomach-tube again. Charcoal may be given in quantity. Give thirty grains of chloral hydrate in a tumbler of water, repeating in quarter of an hour. Give inhalations of chloroform throughout if convulsions are present. Artificial respiration,

SULPHONAL

Sulphonal is slowly absorbed and slowly eliminated. It is, of course, one of a well-known group of hypnotics.

Symptoms—Gastric pain. Vomiting. Constipation. Giddiness. Headache. Hallucinations. Pupils normal. Often cherry-red urine. Collapse. Unconsciousness.

Treatment—Stomach-tube. Hypoderm of apomorphine. Hot-water bottles and warm blankets. Keep patient lying down. Hypoderm of strychnine, gr. $\frac{1}{60}$; Artificial respiration if necessary.

SULPHURIC ACID

Known popularly as Oil of Vitriol.

Symptoms and *Treatment* as Hydrochloric acid. (*Page* 42)

TARTARIC ACID

Symptoms—Severe abdominal pain. Convulsions. Collapse.

Treatment—Give chalk, lime or other preparation of calcium freely in water. Avoid salts of potassium and sodium. Give an ounce of castor oil.

TOBACCO

See Nicotine. (*Page* 48).

TRIONAL

Symptoms and *Treatment* as Sulphonal. Trional is more quickly absorbed and more quickly eliminated.

TURPENTINE

Sometimes accidentally taken in excess or in form of liniment. Occasionally administered criminally.

Symptoms—Breath smells of

turpentine. Thirst. Vomiting. Diarrhoea. Stertorous respirations. Tetanic convulsions. Pupils contracted. Irritable bladder. Urine smelling as of violets.

Treatment—Stomach-tube and hypoderm of apomorphine. Give an ounce of Epsom salts in a teacupful of water. Hypoderm of morphine, gr. $\frac{1}{4}$. Milk, barley-water, white-of-egg and water.

VERMIN-KILLERS

These generally contain strychnine, arsenic, or phosphorus; or some mixture of two of these. Battle's and Butler's Vermin Killers contain strychnine; Simpson's and Roth and Ringeisen's Vermin Killers contain arsenic. The latter contains phosphorus as well.

VERONAL

Veronal, Dial and Luminal occasionally figure among dangerous poisons.

Symptoms—Deep sleep. Coma. Weak pulse. Collapse.

Treatment—Stomach-tube and hypoderm of apomorphine. Keep patient lying down. Give plenty of barley-water and milk by the mouth. Give hypoderm of strychnine, gr. $\frac{1}{60}$. Artificial respiration if necessary.

ZINC

Zinc chloride is used in soldering, and is also the chief ingredient of Burnett's Disinfecting Fluid.

Symptoms—Corrodes lining of mouth. Burning pain in mouth, throat and stomach. Incessant vomiting. Shortness of breath, quick pulse

and breathing. Dilated pupils. Convulsions. Coma.

Treatment—Give large quantities of carbonate of soda or potash in warm water. Also abundant milk, barley-water or white-of-egg and water. Give half-drachm doses of tannin in water. Give hypoderm of morphine, gr. $\frac{1}{4}$.

SHOCK, COLLAPSE and SYNCOPE

The pathology of these states is not fully worked out; but, so far as our knowledge goes, the conditions are sufficiently alike to call for very similar general emergency treatment. A sudden and considerable fall of blood-pressure is, perhaps, the most universal accompaniment, though the causes and the less urgent symptoms may differ widely.

Loss of blood; severe injuries; sudden blows on the abdomen; severe toxaemia in the course of various diseases, such as diphtheria, pneumonia and influenza; causes associated with the administration of a general anaesthetic; reflex stimulation of the vagus nerve; organic heart-disease; or any causes associated with the stagnation of blood in the veins and the splanchnic system; any of these are possible antecedents. Naturally, they will call for diverse remedial activities: but their first-aid treatment, which aims at restoring tone to the capillaries, raising the blood-pressure and securing a sufficient circulation through the brain, is almost identical.

Nature herself generally insists on the first part of the treatment; namely, placing the

patient in the horizontal position. In addition, the feet and trunk should be raised so that there is a slight downward slope to the head. Warmth should immediately be afforded by means of hot-water bottles and blankets, and a cloth wrung out of very hot water may be laid over the heart. A hypoderm of 10 international units of pituitary extract is also an immediate indication; or, if available, adrenalin chloride solution, of a strength one in one thousand, may be injected subcutaneously or intravenously. A hypoderm of morphine, gr. $\frac{1}{3}$, may also be injected. An additional concentration of blood in vital centres and a raising of blood pressure can be promoted by firmly bandaging the limbs and abdomen with flannel bandages, working up from below. Care

must be taken not to interfere with the movements of respiration. A saline injection should be administered as soon as it can be prepared. If the apparatus is at hand, this is best given intravenously. The solution may be made by dissolving two drachms of sodium chloride in a pint-and-three-quarters of distilled or boiled water; or to this may be added a further quarter-pint of water, and half an ounce of glucose. The fluid should be at a temperature of about 105° F., and this temperature should be maintained by adding hot fluid to the fluid in the burette or irrigating vessel as the temperature of the latter falls. The saline fluid should be injected slowly, about half a pint in five minutes. Two minims of adrenalin chloride (one in one thousand) may be mixed with each ounce of the

saline solution, and thus most effectively introduced. In the absence of suitable apparatus, the same saline solution may be infused subcutaneously. The temperature of the solution should be about the same as that advised for intravenous injection, or three or four degrees higher (from 105° F. to 110° F.). The sites selected for injection must be such as will allow the fluid to pour into loose cellular tissue :—below the breast, between the last rib and the crest of the ilium, and in the neighbourhood of the axilla being suitable positions. Sterilise the skin, and anaesthetise the immediate area by injecting novocaine, then puncture with an aspirating needle connected by rubber tubing with an irrigator. All parts of the apparatus should, of course, be sterilised immediately before

use. The irrigator should be held or suspended about three feet above the patient, and fluid should be allowed to run for a few seconds through the needle in order to exclude air and warm the tubing before the actual puncture is made. Not more than half a pint of fluid should be injected into one area. It is well to introduce the fluid not too quickly, and in not too great quantities in one spot, as some delay often occurs in absorption and the temperature of the bag of fluid under the skin falls.

A much simpler and often quite effective method of administering saline solution is by the rectum. The only apparatus needed consists of a rectal tube, desirably ten inches long, a rubber tube three or four feet long, and an irrigator, or a jug and funnel. The

patient should lie on his back with the hips raised, the rectal tube should be introduced to a distance of about nine inches if possible, and the irrigator should be held or suspended about three feet above the patient. A couple of pints of a solution identical with either of those already mentioned, at a temperature of about 110° F., may be thus introduced.

DIABETIC COMA

Rapidly produced unconsciousness may be consequent on the taking of any one of a number of external poisons, especially the narcotics. Cerebral injuries and cerebral haemorrhage have also to be borne in mind. The poisons arising from a number of febrile diseases, such as enteric fever, rheumatic fever, cholera, and

any septicaemia, may induce a comatose condition. Diabetic coma, in the absence of a known history of the disease, may be suspected from the chloroform-like odour of the breath, due to acetone, from the steady, but very deep, inspiration and expiration, and from the detection of sugar in the urine, if any is available for examination. If the necessary simple apparatus is at hand, the blood may be tested for sugar by the methyline blue and caustic potash test. Diabetic coma having been diagnosed, twenty units of insulin should at once be injected intravenously; and this should be immediately followed by forty units of insulin injected subcutaneously. Without any delay, a solution of half an ounce of glucose, thirty grains of bicarbonate of soda, and fifteen grains of sodium chloride, in

one pint of sterile water, should be given by means of a long nasal tube with funnel attached, or subcutaneously. So long as the urine contains sugar, the insulin injections should be repeated every four hours. The alkaline glucose solution should be given in pint doses every hour until the patient becomes conscious.

It should be remembered that coma may occur in a diabetic patient through a deficiency of sugar instead of an excess, owing to an overdose of insulin. If the patient is unconscious, a five per cent. solution of glucose should be injected intravenously.

URAEMIC COMA

A history of renal disease would, of course, lead to a suspicion that a case of coma

was uraemic in origin. In the absence of a history, the possibility of uraemia should be borne in mind if the coma is associated with convulsions; if the heart is hypertrophied; or if the blood pressure is above 180 mm. The treatment should first be concentrated on checking the convulsions, if present. A hypoderm of a half-grain of morphia may be given immediately, supplemented, if necessary, by the administration of chloroform vapour to the point of light anaesthesia. When the venous system is obviously engorged, venesection from the median basilic vein may desirably be practised—up to half a pint of blood being removed. Diaphoresis should be encouraged by hot packs and by the injection of one-sixth of a grain of pilocarpin nitrate; a further

injection being given an hour later. If the patient recovers sufficiently to swallow, a drachm of compound jalap powder should be given at once.

HAEMORRHAGE IN GENERAL

Wherever possible, the immediate control of haemorrhage is to be effected by pressure on the bleeding point, and by raising the bleeding part above the general body-level. If an artery is cut or wounded, or post-operative bleeding from a vessel of any size occurs, it is essential to tie or re-tie the vessel, if necessary opening up the tissues for the purpose. Remember that in arterial bleeding both ends of the cut artery should be tied. Complete

passivity of the patient is, of course, necessary. A doctor should never be without artery-forceps, needles and ligatures in his pocket. Sometimes control of the bleeding needs a preliminary cutting away of ragged torn tissues, or, as in post-partum haemorrhage, the manual removal of clots or tissues which prevent normal contraction. As a part of the treatment of all serious haemorrhages, the treatment described under the heading "Shock and Collapse," or such of it as is appropriate, should be adopted. An injection, hypodermic or intravenous, of adrenalin solution is often helpful.

EPISTAXIS

Bleeding from the nose is of every degree of gravity. Trifl-

ing cases call for no treatment beyond holding the head upright, and gently sniffing. On the other hand, cases may be so severe as to involve actual danger to life. If the bleeding point is visible, (commonly on the septum) it may be touched with cotton-wool dipped in a solution of adrenalin chloride (one in one thousand). The nostril may then be firmly plugged with cotton-wool or sterile gauze dipped in peroxide of hydrogen solution. If haemorrhage recurs, the bleeding point may advantageously be cauterised, conveniently with a bead of chromic acid on the end of a probe, immediately afterwards pressing the cauterised part with a plug of cotton-wool soaked with a saturated solution of bicarbonate of soda. If the bleeding point is not

obvious, plug the nostrils firmly and completely with adrenalin gauze, cotton-wool, or sterile gauze soaked in peroxide of hydrogen. If this fails to control the haemorrhage, the posterior nares should be carefully plugged with cotton-wool, with the help of a Bellocq's sound. The nostrils themselves will also generally require plugging, as before. All plugs should be removed, carefully and gently, within thirty-six hours.

NASO-PHARYNGEAL HAEMORRHAGE

This is sometimes serious, after the incomplete removal of adenoids. The treatment consists in removing any fragments of adenoid tissue, and pressing the bleeding surface with cotton-wool dipped in a solution of adrenalin chloride.

In severe cases, complete passivity, with the head and shoulders somewhat raised, and the inhalation of amyl nitrate, with a possible hypodermic injection of a third of a grain of morphine, constitute the main elements of immediate treatment. There is no sense in injecting drugs like ergot and adrenalin which, by causing constriction of small surface vessels everywhere, increase blood pressure in the pulmonary vessels.

PERSISTENT OOZING from SMALL BLOOD-VESSELS

Apply cotton-wool dipped in solution of adrenalin chloride (one in one thousand). Apply pressure, if possible. Inject into the buttock muscles fifteen c.c. of thirty per cent.

solution sodium citrate, having first anaesthetised the site selected by means of an injection of novocaine.

HAEMORRHAGE following TOOTH-EXTRACTION

This occasionally assumes serious proportions, and should never be regarded as a triviality. When the bleeding persists, it usually comes, not from the socket itself, but from the torn muco-periosteum. It will generally be found that the outer wall of the alveolus is broken into fragments ; and the first thing to do is to remove any loose fragments of bone. Then lateral pressure with sterile gauze should be applied to the soft tissues of the socket. Usually this controls the bleeding. Further treatment may take the form of a pad of gauze exercising

pressure on the soft parts when the jaws are firmly closed on it. If, in spite of these measures, bleeding persists, a stitch through the gum, pulling the soft parts together across the socket, is nearly always effective. 0.5 c.c. of Adrenalin Chloride solution (one in one thousand), may be injected subcutaneously.

ANAESTHETIC EMERGENCIES

Probably most anaesthetic accidents are avoidable. Naturally these should be avoided. Of the remainder some are remediable. By way of prevention much may be done through the wise choice of anaesthetic. A very large proportion of what may be called "general-practice operations" can quite well be done under

local anaesthesia. Many others can satisfactorily be performed under nitrous oxide. Thus the dangers of ether and the much greater dangers of chloroform can be avoided. When the administrator has not the opportunity of acquiring adequate experience in the giving of every anaesthetic, he will be wise to concentrate his study and practice on one only. The safest all-round general anaesthetic that meets the conditions inherent in most operations of general practice is the C.E. mixture, consisting of two parts chloroform, three parts ether. This, like chloroform, is most easily, and probably best, administered by the open method; and the important thing is to maintain the vapour throughout in a sufficient state of dilution. With pure chloroform, the

vapour should never amount to more than two per cent. of the inspired air. With C.E. mixture the percentage should be a little higher. In neither case should the mask ever touch the face. Hurry in getting the patient under is fatal. A grown-up person should take anything from five to ten minutes to reach complete anaesthesia. With patients who struggle or develop spasms whilst being got under, there is always a temptation to add more chloroform to the mask. This is wrong practice. It is better, until the spasm is over, to substitute ether for chloroform on the open mask. It should be remembered that the starting of the operation before the patient is fully under is likely to cause much deeper breathing, and an overdose is often taken in this way.

Pallor and shallow breathing are symptoms that call for attention. If, with these manifestations, the pupil is small and the corneal reflex remains, the anaesthesia is probably light, and vomiting is likely. Respiration should then be encouraged by briskly rubbing the lips with a towel, and a few drops of the anaesthetic should be added to the mask. If, however, the pallor and shallow breathing are accompanied by a dilated pupil, and if the corneal reflex is imperceptible, there is overdose, and the patient is in danger. The mask should be at once withdrawn, the lips should be briskly rubbed with a towel, the head lowered, the chest walls compressed, the mouth opened and the tongue drawn forward by tongue-forceps or artery-forceps. If

breathing does not promptly start, artificial respiration by Sylvester's method should be begun. Each complete act of respiration should occupy at least three seconds; so that not more than twenty complete movements should be effected each minute. In children and thin subjects, an attempt may be made to massage the heart through the chest-wall and diaphragm; and, if the heart has quite stopped, adrenalin may be injected by means of a long needle direct into the heart muscle. In most cases of anaesthetic collapse there is considerable loss of tone in the splanchnic blood-vessels as in other cases of shock. If the heart is beating, help may be given by the injection of adrenalin or pituitrin, and the sub-cutaneous or intravenous injection of saline solution.

RESTORING THE APPARENTLY DROWNED

The patient's mouth and throat having been rapidly cleared of any obstructing substance, his tongue should be pulled forward—by forceps that pierce rather than bruise—and, if possible, secured in that position. Then, if there is the tiniest possibility of resuscitation, the patient should immediately be laid face downward with a rolled-up coat or other pad placed under the epigastrium. The manipulator, kneeling astride the body and placing his hands on the lower ribs, should, by alternately raising and lowering his own body, compress and release the lower parts of the patient's chest. The double movement should be repeated some fourteen

times a minute; and should be continued so long as any hope remains, even though spontaneous breathing may be delayed for a couple of hours. It may be left to others to supplement this most important part of the treatment by such lesser measures as rubbing the face and the surface of the body generally; and by covering the exposed parts with warm blankets if available — wet clothing being so far as possible replaced thereby. Schafer's method of artificial respiration, above described, is in these cases safer, more effective, and less fatiguing to the operator than other methods commonly employed.

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